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MCC Press Release

The rate of global heating caused by humans is at an all-time high

Second update of the "Indicators of Global Climate Change" research initiative with contributions from MCC. The 1.5-degree Celsius threshold is all but breached.

Berlin, 05/06/2024. Global heating caused by humans is advancing at 0.26 degrees Celsius (°C) per decade – the highest rate since records began, according to research by over 50 leading international scientists. They find that in 2023, global surface temperatures were 1.43°C above their pre-industrial levels, with human activity accounting for 1.3°C of that figure. The "Indicators of Global Climate Change" research initiative is being led by the University of Leeds, and supported by the Berlin-based climate research institute MCC (Mercator Research Institute on Global Commons and Climate Change). The indicator report has now been published in the renowned journal *Earth System Science Data.*

The report finds that the high rate of heating is driven by consistently high greenhouse gas emissions, equivalent to 53 billion tonnes of CO_2 per year. On the other hand, the certain degree of human-caused cooling from particles in the atmosphere is decreasing due to improvements in air quality. High greenhouse gas emission levels are also affecting Earth's energy balance: ocean buoys and satellites are tracking unprecedented flows of heat into oceans, ice caps, soils and the atmosphere. This flow of heat is 50 percent higher than its long-term average.

"The analysis comes as climate experts meet in Bonn to prepare the ground for the COP29 climate conference in Azerbaijan," highlights Jan Minx, head of the MCC working group Applied Sustainability Science, and a co-author of the study. "By providing this second data update, we aim to help close the information gap, particularly when climate indicators are changing rapidly." The authoritative source of scientific information on the state of the climate is the UN's Intergovernmental Panel on Climate Change (IPCC), but its next major assessment will not happen until around 2027.

According to the new report, the 1.5°C threshold noted in the Paris world climate agreement is all but breached. The central estimate for the remaining carbon budget – how much carbon can be released into the atmosphere to give a 50 percent chance of keeping global temperature rise within 1.5°C – is 200 gigatonnes of CO_2 by the start of 2024. This is 60 percent less than 2020, when the IPCC had calculated it at around 500 gigatonnes. (Note: these figures are not comparable with those used in the MCC Carbon Clock, where the annual emission rate is for CO_2 only, and the contribution of other greenhouse gases to global heating is subtracted before calculating the remaining carbon budget. Furthermore, the budget is

calculated with reference to a 67 rather than 50 percent probability of complying with the temperature limit.)

Piers Forster, Director of the Priestley Centre for Climate Futures Leeds and lead author of the study, says: "Even though climate action has slowed the rise in greenhouse gas emissions, global temperatures are still heading in the wrong direction and faster than ever before. Our analysis is designed to track the long-term trends caused by human activities. Last year, when observed temperature records were broken, natural factors were temporarily adding around 10 percent to the long-term warming." William Lamb, researcher at MCC and lead author of the study's emissions section, says: "Until we dramatically reduce deforestation and the combustion of coal, oil and gas, greenhouse gases will continue to accumulate in the atmosphere and drive climate impacts."

The indicator report is accompanied by an open-data, open-science "Climate Change Tracker" platform. The tracker provides easy access to the key climate indicators.

Further information:

- The study: Forster, P., Smith, C., Walsh, T., Lamb, W., Lamboll, R., Hall, B., Hauser, M., Ribes, A., Rosen, D., Gillett, N., Palmer, M., Rogelj, J., von Schuckmann, K., Trewin, B., Allen, M., Andrew, R., Betts, R., Boyer, T., Buontempo, C., Burgess, S., Cagnazzo, C., Cheng, L., Friedlingstein, P., Gettelman, Gütschow, J., Ishii, M., Jenkins, S., Lan, X., Morice, C., Muhle, J., Kadow, C., Kennedy, J., Killick, R., Krummel, P., R., Minx, J., Myhre, G., Naik, V., Peters, G., Pirani, A., Pongratz, J., Schleussner, Seneviratne, S., C., Szopa, S., Thorne, P., Kovilakam, M., Majamäki, E., Jalkanen, J., van Marle, M., Hoesly, R., Rohde, R., Schumacher, D., van der Werf, G., Vose, R., Zickfeld, K., Zhang, X., Masson-Delmotte, V., Zhai, P., 2024, Indicators of Global Climate Change 2023: annual update of key indicators of the state of the climate system and human influence, *Earth System Science Data* https://doi.org/10.5194/essd-16-2625-2024
- The data platform "Climate Change Tracker": https://climatechangetracker.org/igcc
- The website "Indicators of Global Climate Change": https://www.igcc.earth/

About MCC

MCC explores and provides solution-oriented policy portfolios for climate mitigation, for governing the global commons in general, and for enhancing the many aspects of human wellbeing. Our six working groups are active in fields like economic growth and development, resources and international trade, cities and infrastructure, governance, and scientific policy advice. Co-founded by the Mercator Foundation and the Potsdam Institute for Climate Impact Research. | www.mcc-berlin.net/en | https://twitter.com/MCC_Berlin

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